Response to Fifth Office Action

This is a response to your office action which rejected claims from our patent application, "Image Transfer and Archival System", filed on July 23, 2001.

In section 2 of the last office response the examiner states that "a means for optionally making a copy of an image" from claims 1 and 12 is not found in the specification. The specification states, "There are many conditions under which image 305 must be put into queue 325 before it can be sent to server 210." As written, this sentence means there are some conditions that the image must be put (copied) into the queue.

In section 2 of the last office response the examiner states that "a means to persisting an image on a server device" from claims 1 and 12 is not found in the specification. There are numerous references to this in the specification. For example, "FIG. 3 is a block diagram illustrating a system according to the invention for transmitting digital images from a client machine to a server machine for archiving and other analysis or display." In the context of software engineering the terms persist and permanently store are synonymous(http://www.techweb.com/encyclopedia/defineterm.jhtml?term=persistence).

In section 2 of the last office response the examiner states that "transferring the image from the client device to the server device as a digial signal such that a permanent copy of the image is not maintained on the client device" from claims 1 and 12 is not found in the specification. The specification says "The client transfer mechanism also includes a queue 325 to hold images prior to transmission to the server 210." One can infer from

this statement that the images are no longer kept once the image has been transmitted to the server. Another statement in the specification states, "However, the queue can be saved on a mass storage device as well or be split between system memory and mass storage. Maintaining the queue on anything other than fast system memory has an associated cost because it requires other system resources and processor time to affect the transfer of image 305 to the queue 325." The specification says that while mass storage devices can be used for the queue, they are not preferred because of the added overhead. Lastly, the specification says, "For real-time and other high-performance applications, the client transfer mechanism must be concerned with transferring the image 305 to the server 210 within the resource constraints of the system." This statement says the client device has limited resources and hence there will be no permanent copies of the images maintained on the client device.

In section 5 of the last response the examiner found that claims 1 and 12 has insufficient antecedent basic by the use of "the image". Claims 1 and 12 have been amended to correct this issue. The first reference to "the image" has been replaced by "an image".

In section 6 of the last response the examiner found that claim 14 has insufficient antecedent basis by the use of "the volatile image". Claim 14 has been amended to correct this issue. The first reference to "the volatile image" has been replaced by "a volatile image".

In section 7 of the last response the examiner states that all claims are narrative in form. Claim 14 has been amended to remove an extra period found in the claim. Claims 1, 12, and 14 have been amended to better connect each step of the claim to the previous step of the claim using the word 'said' as appropriate. In addition, text from a previous step of the claim is recited in subsequent steps using 'wherein' to better organize and correlate the steps together.

In section 9 of the last response the examiner rejects claims 1,2,4-9, 12-18 as being unpatentable over Tanaka (U.S. Patent No. 6,584,256) in view of Ohtake (U.S. Patent No. 6,111,591), futher in view of Mummert (U.S. Patent No. 6,427,152). Tanaka's invention involves transferring medical images between a client and server using a relay server.

In Claims 1 and 14 the examiner states that Tanaka teaches the step of dynamically reducing the size of images in the client queue to either conserve storage space in the client queue or to reduce transmission time. However, this reference (col. 10, lines 64-65) teaches that the image format and size is changed into a form that can be displayed by a web brower, as well as compressing the data size if the image data is too large. In our invention a multi-step reduction mechanism is employed in order to send as much useful information to the server device as possible. To avoid any further confusion, we have amended Claims 1 and 14 to specify that the dynamic reduction is intended to allow transmission of the image from the client to the server before it must be deleted (ie. before the queue is full).

In Claims 1 and 14 the examiner states that Tanaka teaches the step of making a copy of the image to free up system resources on the client. The examiner cites no references and the applicant has been unable to find any. Tanaka includes a cache in his invention to allow the same image to be delivered to multiple client devices. Tanaka contains nothing that resembles an image queue and is silent about the need to manage resources.

In Claims 1 and 14 the examiner states that Tanaka teaches the step of transferring the image from the client device to the server device as a digital signal such that a permanent copy of the image is not maintained on the client device (col 5, lines 33-46). In Tanaka, the server is the device which holds the original digital images, and the clients are the devices that display these images. In our invention, the roles are reversed; the client produces the images, and they are transmitted to the server. In Tanaka the server is a large database which holds a permanent collection of medical images. A representation of these images can be delivered to terminals for display. Our invention is claiming something completely different; the short-lived images on the client must be transmitted to the server or they will be permanently deleted. Claim 14 refers to an image as a "volatile image." This change was made to narrow the focus of the claim to images that have a short life span. Tanaka's invention involves permanent images that are stored in an image database. The design of our system is entirely different than one employed by Tanaka. Tanaka does not disclose claims 1 and 14.

In Claims 1 and 14 the examiner states that Tanaka in view of Ohtake and Mummert teach the step of measuring the availability of local client resources including available processor time and means for maintaining historical information and trends of client resources and the step of measuring the measuring the status and performance of the network connecting the client device and server device, and means for maintaining historical information and trends of the network. The examiner claims the motivation to modify Tanaka in view of Ohtake is to decrease the loads on host systems in an image processing system. In our invention, the need to measure the network and resource availability is needed to preserve the integrity of images that are transmitted from the client to the server. Tanaka describes a medical image processing system. Ohtake's information processing system shares a buffer with data received from multiple input interfaces. Mummert describes a computer storage system that forecasts the storage capacity. Contrary to your assertion, a person of ordinary skill would be unable to connect these three patents. Tanaka and Ohtake never mention the need to measure resource and network performance. Thus, Tanaka and Ohtake neither teaches nor suggests either the problem or the resolution to the problem as claimed in Claim 1. Mummert deals with the generic task of storage capacity planning. However, neither Tanaka nor Ohtake discuss the issues of storage capacity and provides no motivation for its use. Given that Tanaka and Ohtake do not address the problem or solution regarding resource monitoring, and Mummert are discussing a completely different subject area, it is not obvious to modify Tanaka and Ohtake in view of Mummert.

In claims 5, 6, 16, and 17 (and the last portion of claim 8), the examiner claims that Tanaka teaches a system that comprises the means for selecting one or more reduction methods to reduce the image size from a plurality of lossless or lessy compression methods; means for reducing the current image, or reducing any image in the queue when the queue becomes full; means for periodically reducing the size of the images in the queue, using reduction methods when processor resources are available (col. 10, lines 53-65). The Tanaka reference says that the image is converted into a format viewable by a web browser, and that compression is used if the image size is too large. This is the cited reference:

> Further though, in third and fourth embodiments, the protocol conversion servers PT1 and PT2 convert only the protocol of the medical image data, the protocol conversion servers PT1 and PT2 may, when the medical image data is in a format which cannot be displayed by the web browser, convert the format of the medical image data to a format which can be displayed by the web browser, e.g., JPEG, before transferring the medical image data to the terminals T1 to Tn. Further it is possible to arrange the protocol conversion servers PT1 and PT2 to, when the medical image data is too large in data size, compress the data size of the medical image data before transferring the medical image data to the terminals T1 to Tn.

The invention of Tanaka performs format conversion on the image that was requested by the user. There is no queue, no mention of reducing the size of the queue when processor resources are available, no mention of using lossless or lossy compression methods and no mention of estimating the cost of reduction in order to see if it can be performed. The applicant can find no reference in Tanaka to support that Tanaka teaches the elements of these claims. The examiner admits in section 11 of the last office response that "Tanaka and Ohtake fail to teach the limitation further including selecting one or more reduction methods to reduce the image size from a plurality of lossless or lossy compression methods and using lossless compression methods when processor resources are available." Therefore, Tanaka does not describe claims 5 and 6.

In claims 8 and 18 the examiner references Tanaka (col 6., lines 49-56, col. 10, lines 4-15) as prior art. In both of these references, Tanaka states that "the relay server can distribute the requests to other relay servers" and "the protocol conversion servers can distribute the requests to other protocol conversion servers." In other words, Tanaka is describing load balancing to improve efficiency. Tanaka provides no other details. Tanaka does not discuss nor provides any motivation for verifying if sufficient system resources and time exist to reduce an image. Tanaka does not discuss nor provides any motivation for using historical trends to estimate future resource availability. Tanaka does not discuss nor provides any motivation for checking current network bandwidth and throughput. Tanaka does not discuss nor provides any motivation for estimating future network conditions using historical trends. Therefore, Tanaka does not describe claims 7 or 18.

The examiner states that claim 9 is covered by Tanaka (col 10, lines 18-52) because he discloses using only a certain amount of protocol conversion servers. Tanaka is not describing what we describe in claim 9. Tanaka does not use the protocol conversion servers as a queue. He uses them for fault tolerance and efficiency. The notion of increasing the size of a queue up to a certain size has no parallel in Tanaka's invention because the hardware configuration is static. It is nonobvious to a person having ordinary skill in the art to extend the invention described by Tanaka to produce what our invention describes.

On page 5 of the last office response, the examiner state, "Tanaka fails to teach the limitation further including means for transferring the image to a client queue if the image cannot be transmitted immediately and increasing the size of the client queue if it becomes full due to the accumulation of images in the queue". If Tanaka does not discuss increasing the size of the client queue, he certainly cannot discuss setting an upper bound on the queue size. Therefore, Tanaka does not describe claim 9.

In claim 12, the examiner cites a number of Tanaka references. Claim 12 can be analyzed like Claim 1. To summarize those arguments, Tanaka does not discuss or provides any motivation for storing transient images in a queue, measuring resource availability, and transforming images as necessary to conserve space in a queue. Ohtake does not increase the size of the client queue. Rather, Ohtake estimates an upper bound of the memory requirements in the buffer and allocates sufficient memory to match this requirement. There is one additional step, "dividing the available network bandwidth between the client and server into one or more pieces and assigning certain images to be transmitted using these reserved channels." You cite Tanaka (col. 5, lines 47-55) as "disclosing using different relay servers and piecing the image". However, this section of Tanaka describes using a cache to accumulate pieces of medical image data to be transmitted to a terminal. Tanaka does not discuss nor provides any motivation for reserving bandwidth between client and server and assigning certain images to use this reserved bandwidth. Neither Tanaka nor Ohtake discusses resource availability, measuring network performance, or reducing images to conserve storage space. The examiner's introduction of Mummert does not change this. The examiner states that "One would be motivated to do so because

it allows for the use of statistical data to improve image transmission efficiency." The motivation of our invention is to permit images to be transmitted from a client device to the server device such that the number of client images that gets deleted is minimized. Tanaka describes a medical image processing system. Ohtake's information processing system shares a buffer with data received from multiple input interfaces. Mummert describes a computer storage system that forecasts the storage capacity. Contrary to your assertion, a person of ordinary skill would be unable to connect these three patents. Tanaka and Ohtake never mention the need to measure resource and network performance. Thus, Tanaka and Ohtake neither teaches nor suggests either the problem or the resolution to the problem as claimed in Claim 1. Mummert deals with the generic task of storage capacity planning. However, neither Tanaka nor Ohtake discuss the issues of storage capacity and provides no motivation for its use. Given that Tanaka and Ohtake do not address the problem or solution regarding resource monitoring, and Mummert are discussing a completely different subject area, it is not obvious to modify Tanaka and Ohtake in view of Mummert.

In claim 13, the examiner cites Tanaka (col. 9, lines 1-37) as disclosing the step of reserving network bandwidth comprising specifiying the mapping of image type to a reserved piece of network bandwidth, using any remaining, unreserved network bandwidth for images that do no have any defined mapping, allocating a separate queue for each piece of network bandwidth, identifying the type of image and routing this image to the appropriate piece of network bandwidth or queue. The assignment of bandwidth is very different than the assignment of server (which is what Tanaka

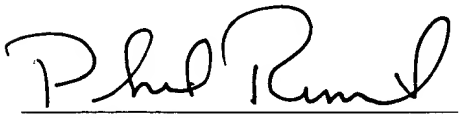
describes). Tanaka does not discuss or provides any motivation for specifying a mapping of image type to a reserved piece of network bandwidth. Tanaka describes that certain terminals will send their requests to a particular protocol conversion server. Tanaka does not discuss or provides any motivation for using unreserved network bandwidth for images that have no defined mapping. Tanaka does not discuss or provides any motivation for allocating a separate queue for each piece of network bandwidth. Tanaka does not discuss or provides any motivation for identifying the type of image and routing the image to the appropriate network bandwidth or queue. Therefore, Tanaka does not disclose claim 13.

In section 11 of the last response the examiner rejects claims 10 and 11 as being unpatentable over Tanaka, Ohtake, and Mummert further in view of Lopresti (U.S. Patent No. 6,298,173). Claims 10 and 11 are identical to claims 5 and 6 except that the image reduction means occurs on the server device as opposed to the client device.
Tanaka describes a system to transfer medical images between a server and a terminal. Ohtake describes a system to handle multiple host systems. Mummert describes a computer storage system that forecasts the storage capacity. Lopresti describes reducing storage space of text and images in a storage management system. Contrary to your assertion, a person of ordinary skill would be unable to connect these four patents. Neither Tanaka, Ohtake, or Mummert teaches or suggests either the problem or the resolution to the problem as claimed in Claim10 and 11. Lopresti discloses how the size of an image database can be reduced by using lossless and lossy reduction methods. Lopresti is not directed to solving any problem related to image transfer, dynamically

reducing transient images, or a time-constrained reduction process. Neither Tanaka nor Ohtake nor Mummert discuss the issue of saving space in an image database and provides no motivation for its use. Since Lopresti is discussing a completely different subject area, it is not obvious to modify Tanaka, Ohtake, and Mummert in view of Lopresti. Therefore, a combination of Tanaka, Ohtake, Mummert, and Lopresti does not describe claim 10 and 11.

The Applicants respectfully ask the Examiner to enter the amendments, reconsider and withdraw the rejections, and pass the application, as amended, to issue.

Respectfully submitted,



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